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# The North Pickering Project

**Urban Systems Analysis:  
Synthesis and Implications  
for North Pickering  
(Background Paper No. 7)**



December, 1974



Ministry of  
Housing

Ontario

This report was prepared as background material in the Planning of The North Pickering Planning Area and does not necessarily constitute a recommendation of the North Pickering Project nor approval of the Government of Ontario.

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## INTRODUCTION

This paper summarizes the principal findings of the Urban Systems Analysis exercise of the North Pickering Project's economic planning process. It indicates the guidelines which can be drawn from these findings and, most important, sets out the principal *implications* for the economic planning of the new community.

The Urban Systems Analysis was carried out between January and September of 1974, with some refinements and extensions up to December of the same year. The objectives of this exercise were to provide estimates of the possible level, growth and make-up of employment in North Pickering (1986/91) so as to provide guidance on the degree and nature of the gap which could exist between what *might* happen, under *normal market conditions*, as against what is regarded as desirable or *should* happen, under a set of planning objectives.

In order to generate a range of market-induced possibilities for North Pickering around 1986-91, the approach adopted was to critically review spatial urban economic patterns in most of the Central Ontario Planning Region and the metropolitan-lakeshore area in 1970/72 and the period 1961-71 (Fig. 1). The approach sought to identify urban size, location, growth, employment-mix and other regularities, to provide some insight into the forces which will affect North Pickering's prospects and to furnish some partial urban economic analogies in the current metropolitan environment.

The urban systems analysis had three components.\*

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\* See the three background papers, The "Market" Profiles for North Pickering: Some First Impressions, (March 1974), Urban Systems Analysis: A Literature Review (October 1974) and Urban Systems Analysis: Aggregate Analysis of Regional and Lakeshore Corridor Patterns (December, 1974).



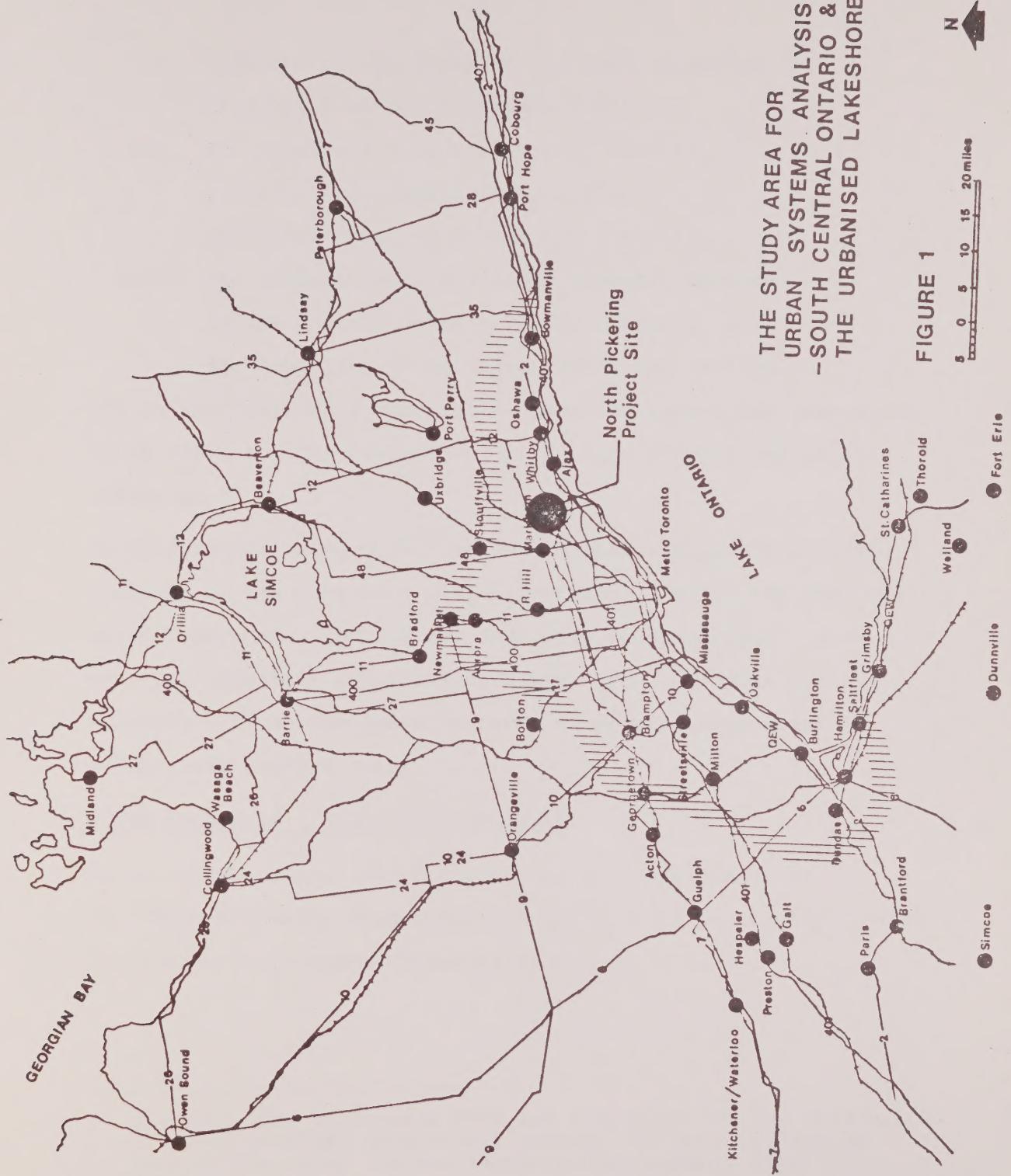


FIGURE 1



- (i) A review of the research and local planning literature on urban systems analysis.
- (ii) The preparation of preliminary "market profiles" to suggest the possible employment make-up of the new community.
- (iii) The analysis of broad urban economic patterns in the Central Ontario Planning Region and the immediate metropolitan-lakeshore setting.

The latter involved a substantial exercise toward the generation of an urban economic data base, with place-of-work employment estimates.\*

In this report those objectives which most affect the economic planning of the community will be outlined. Following this the general prospects for the new town will be summarized. Then, the most important implications coming from the urban systems analysis will be discussed in terms of growth, employment volumes and sectoral mix.

#### NORTH PICKERING - SELECTED OBJECTIVES

Among the objectives for the planning and development of the North Pickering community, a number are of particular concern to the economic planning area.

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\* Place-of-work employment data are essential for the analysis of urban economic structure. Without the availability of these, other than for manufacturing employment, from Statistics Canada, the original analytical programme had to be substantially reduced and an independent data base generated within the Project during the summer of 1974.



Employment Objectives for North Pickering

GOAL To build a New Community in which residents may conveniently choose to both live and work.

Objective (i) To balance the number of jobs with the size of the labour force living in the new community.

Objective (ii) To provide a wide range of job opportunities in office, professional and industrial employment.

Objective (iii) To encourage at least 50% of the new Community's resident labour force to both live and work in North Pickering.

Objective (iv) If the proposed airport is built, to take advantage of, rather than be dominated by airport employment.

What are the prospects of these basic objectives being met under *normal market conditions*? What do the findings of the urban systems analysis suggest?



## THE VIEW FROM THE REGIONAL AND LAKESHORE/METROPOLITAN PERSPECTIVES

### GENERAL

In the very long-run, it is likely that North Pickering (population 70-90,000) like any city on the metropolitan periphery, *could* progress from being a town with a substantial dormitory population and an economic base dominated by manufacturing activities to a city more representative of a mature urban place. The latter condition *could* be characterized by the presence of a large service sector, including services to business and management and a relatively high live/work potential for the local labour force. This progression however, from the dormitory, manufacturing town to the diversified city, is what is likely under *market conditions* and would normally take several decades.

*The lag in this progression, over time, is therefore a matter which will have to be addressed by planning and implementation measures if a more "balanced" mix of employment and general urban opportunities is to be maintained throughout most of the initial period, 1977-86/91.*

### LITERATURE REVIEW - SUMMARY

#### GROWTH - POPULATION

The review of relevant research and planning literature has, not unexpectedly, produced a rather heterogeneous and uneven array of guidelines for North Pickering. With reference to the growth prospects all studies indicate an increased polarization of growth toward major metropolitan areas. For larger places, initial size has been posited as a major determinant of growth. Most places close to major metropolitan areas however, are usually assured of strong growth. The rates of in-migration to these places have been



closely related to the rate of municipal expenditures and the increase in manufacturing employment opportunities. As a place gets larger, greater stability in its growth rate may be expected.

#### EMPLOYMENT

With reference to employment, it appears that the actual size of North Pickering will be important in encouraging the location of new industries and thus offer opportunities for meeting occupation/income objectives. However, size itself does not appear to ensure industrial diversification; the town could in fact function as a relatively specialized manufacturing location with relatively few economic flows with other parts of the lakeshore.

North Pickering is situated in an area which has been conducive to the location of many foreign-owned plants. As part of the general metropolitan area it will likely benefit from the relocation of activities from various parts of the metropolitan region and the suburbanization of activities out from Toronto to the periphery. The most mobile industries in the Toronto setting tend to be machinery and furniture and fixture industries. The majority of the in-coming enterprises will tend initially, to be small. However, the record of expansion after relocation is a very vigorous one. This could imply the need for a fairly generous expansion allowance when the size of industrial areas is being planned. It is important to note the record of the metropolitan suburbs as generators of new manufacturing activities, in addition to being receptors of relocating enterprises.



In terms of retail and service activity, besides the immediate metropolitan effect, North Pickering may follow the record of small to medium-sized places in Canada and have a low rate of retail and service employment growth, relative to manufacturing growth. What studies have been completed for service decentralization suggest that some activities can benefit substantially (in terms of rent and other factors) from small moves. Often these services will be those least dependent upon multi-purpose trips and will be those seeking a high-income, suburban-type location. Some sources suggest that in terms of growth rates relative to the metropolitan area proper, the wholesale, retail, manufacturing and service sectors would demonstrate the highest growth in that order. In terms of absolute change the highest growth would be in manufacturing, retail, wholesale and service employment, in that order. All studies are consistent in raising the possibility of considerable service, and some retail, deficiency in a place like North Pickering.

#### PRELIMINARY ASSESSMENT OF POSSIBLE "MARKET" PROFILES - SUMMARY

The preliminary assessment of possible "market" employment profiles was based upon suitable data collected by March 1974 and a small number of studies relating to the location of manufacturing and other industries in the general Metropolitan Toronto area.\* This paper emphasized the complex forces at work along the metropolitan periphery, involving the confluence of micro-locational decisions within a metropolitan environment and macro-locational behaviour within a regional context.

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\* See the background paper, The "Market" Profiles for North Pickering: Some First Impressions, North Pickering Project, Ministry of Housing (March, 1974.)



The more important implications for North Pickering are:

1. The new town will likely share in the on-going polarization of manufacturing opportunities within Southern Ontario.
2. The new town should benefit cumulatively from regional concentration, metropolitan out-migration (overspill) and the location of new enterprises.
3. The rate of increase in employment could be below the rate of increase in the number of manufacturing establishments.
4. The larger plants will tend to be more capital intensive and less oriented toward Metro even though a considerable proportion will likely use the transshipment and other facilities in the immediate metropolitan area.
5. Because the location of industry tends to influence the direction of relocation the growth of North Pickering's manufacturing base may be curtailed somewhat by the relatively modest manufacturing base in the eastern and northeastern sector of Metropolitan Toronto.
6. Given the prospect of larger plants on the periphery there are indications that there may be a relatively low level of inter-industry linkages on-site and a minimum of sales to local markets.
7. North Pickering's potential for a strong competitive edge in serviced industrial land costs could be a major determinant of the growth of the town's economic base.
8. The possible advantages of proximity to a major airport are uncertain and are not usually offered as a clear determinant of substantial growth.



9. North Pickering and other peripheral places should have a particularly high potential to accommodate chemical, light manufacturing, paper, printing and publishing, metal fabricating, furniture and fixtures, wholesaling and related industries.
10. North Pickering should have a number of important competitive characteristics which have been cited by firms considering moving from the city of Toronto. These may include good access to a large metropolitan labour force, more dependable trucking and rail facilities and plenty of space, new buildings and modern facilities.
11. North Pickering is likely to have a relatively modest proportion of total employment in services.
12. The possible presence of an airport may not significantly increase employment in the new town's retail sector.

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#### AGGREGATE ANALYSIS OF REGIONAL AND LAKESHORE/METROPOLITAN PATTERNS - SUMMARY

The urban system of south-central Ontario provides some guidelines and insights into the urban economic structure and growth processes at work. The highly aggregated data base generated in the North Pickering Project, from a wide array of sources, provides a broad overview of the urban system.

Two system-wide forces have been emphasized in the three reports listed previously.

1. The hierarchical forces which tend to give each city a particular mix of retail, service and other



activities depending upon the city's size (market) and distance from competing centres. There is thus a certain order or pattern in the urban system which reflects the resolution of consumer access preferences on the one hand, and the distribution cost constraints of retail, service and administrative undertakings on the other. The composite of activities gives each place an overall functional role (e.g. regional, sub-regional or first-order, second-order centres).

2. The metropolitan forces which tend to complicate the ordered regularity of hierarchical patterns by centralizing economic activities and population in large metropolitan areas. This leads to an urban economic system characterized by metropolitan dominance. In such a setting, horizontal or spread forces are stronger than hierarchical (vertical) forces. This means that distance from the dominant metropolitan area is a more important factor than a city's size, as a determinant of its functional make-up.

Central place studies from which most hierarchical concepts have come, have found that for retail and service activities, positive curvilinear relationships between population and,

- (i) number of functions,
- (ii) number of establishments, and
- (iii) number of "functional units"\*

The number of functions and establishments increases at a

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\* See Urban Systems Analysis: A Review of the Literature, for definitions and more detailed discussion.



decreasing rate as city size (population) increases. These studies and the conceptual framework emanating from them, attempt to provide city-size thresholds or conditions of entry, to indicate when certain functions will appear in an urban place.\* Most empirical studies examine urban systems which best approximate the assumptions of central place theory, i.e. rural economic base, minimum of metropolitan influence.

Other studies have found that cities near large urban complexes tend to be deficient in personal and business services and some retail activities. This appears to be due to a number of causes.

1. The metropolis offers a greater variety of personal services, for both the residents of neighbouring towns and their potential market, for a marginal increase in travel cost..
2. Purchasers are prone to "package" retail and service outlays into one trip, rather than making a series of separate journeys for a range of purchases.
3. The consumer nowadays has considerable mobility and can avail of a spectrum of retail and service opportunities over some distance from his or her place of residence.

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\* However, the relationship between the size of an urban place and its functional complexity is more correctly described as that between *market size and functions*. The types of goods and services offered in a city are dependent upon the nature and size of the market, both resident in the urban area and beyond. The effective size of a market area in turn depends, amongst other things, upon the quality of transportation connecting the centre to the area.



4. The metropolis offers many external economies and related advantages for services to business and management.
5. The metropolis offers the consumer and producer an image, creating intangible benefits related to prestige, involvement, visibility and well-being.
6. Commuting tends to set patterns of travel and affiliation. The metropolis as primary job-source thus reinforces its retail and personal service hegemony.

Cities in the COLUC\* are in close proximity to Metropolitan Toronto. This proximity may have both a positive and a negative influence on the economic structure of these surrounding communities. Positive effects (population, manufacturing and some retail growth) tend to spread out along development corridors or axes, with the centre being Metro Toronto. Corridors evolve along paths of greatest accessibility (i.e transportation networks) and between cities which have the greatest economic development. Negative effects are characterized by a diminution in the service and retail base of communities surrounding a metropolis. High dormitory populations may also be regarded as a negative outcome. In the metropolitan/corridor setting North Pickering, beyond convenience retail goods and personal services, will compete in complex markets which encompass most of the metropolitan area and indeed, much of the lakeshore itself. In rural settings it is not too difficult to identify and measure the market. In metropolitan regions and urban corridors the

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\* The highly urbanized area stretching from Hamilton through Oshawa known as the Central Ontario Lakeshore Urban Complex.



the continuous urban fabric is marked by overlapping trade areas, a variety of urban centres, increasing specialization in urban sub-centres, relatively high mobility and even access to most parts of the urban continuum.

In reality of course, both hierarchical and metropolitan processes operate within the total urban system. Urban structure and growth depend upon the critical dimensions of cities (size, economic base, etc.) and the interactive flows between cities. The economic make-up of cities and the nature of urban interaction depend upon such factors as distance to competing centres, local decision-makers' attitudes toward industrial development, historical factors, metropolitan dominance and industrial location requirements. There is a complex cyclical process of urban size and economic base influencing inter-urban flows, and these same inter-urban flows redounding on urban size, growth and economic base.\*

The literature review and later discussions have highlighted the complexity of the metropolitan corridor setting within which North Pickering will grow. Empirical evidence for useful (i.e. predictive) city-size regularities are, as noted, both inconclusive and contradictory. No absolute size/function/distance relationships are evident at the regional level. This suggests that they are non-existent or cannot be ascertained until much finer data are available. The weak relationships do indicate that in the general metropolitan area, site

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\* Besides the aggregative nature of the data generated, the lack of urban economic series precluded any attempt at identifying critical growth processes. These are far more relevant than static, cross-sectional regularities which may be evident in the urban system today.



and other local factors are likely to be more important today and are more reliable indicators for the future, than system-wide or aggregate regularities.

In the case of North Pickering therefore, the most important factors which will tend to distort system-wide empirical regularities are:

1. proximity to Metropolitan Toronto
2. possible airport influence
3. "new town effects"
4. complex corridor setting

Given the above comments and North Pickering's geographical proximity to Metro Toronto, non-hierarchical forces are undoubtedly stronger than hierarchical. The development context is one of *metropolitan dominance*. This indicates that some retail and service activities (personal and business), typical of cities of certain sizes, will tend to be absent from, or poorly represented in North Pickering and concentrated in the metropolis. Conversely, as a fringe metropolitan site North Pickering is a candidate recipient of metropolitan manufacturing, distribution, shopping centre and some business activities.

The empirical patterns observed in the Central Ontario Planning Region were drawn together to produce a series of employment profiles, or sectoral split possibilities for North Pickering (Fig.2). The more immediate lakeshore/metropolitan scene was examined to refine the regional perspectives, to derive employment volumes (activity rates) and to assess the degree of service deficiency and manufacturing dominance.



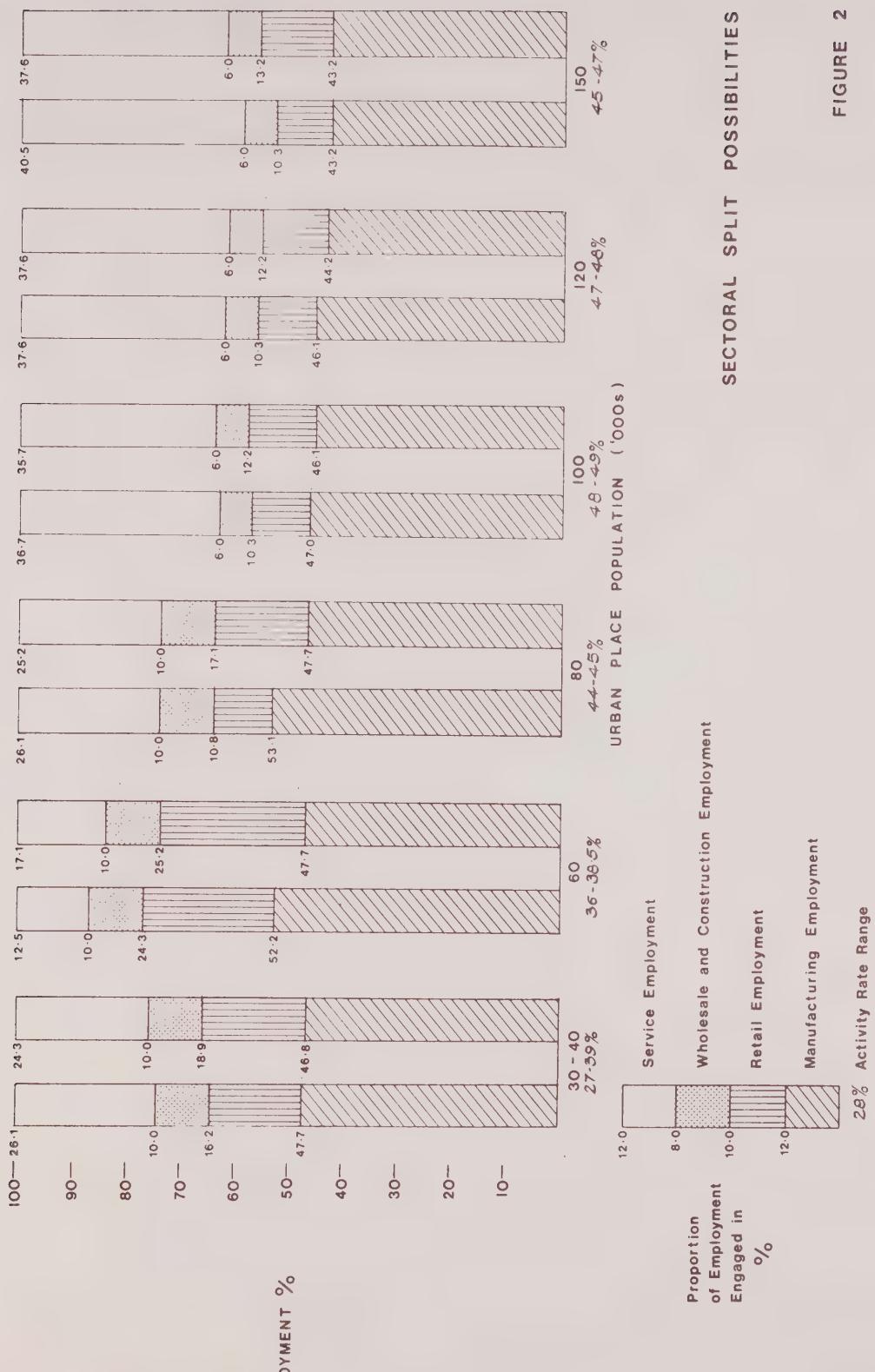


FIGURE 2



For a city of 70-90,000 (1986/91) a limited number of possibilities were suggested (Figure 3).

#### FINDINGS

The principal findings of the urban systems analysis relate to a new town of 90,000 (1986/91) without an airport.\*

The findings are best summarized under the three headings of growth, employment and employment profiles.

#### GROWTH PROSPECTS

There is little to indicate that North Pickering is lacking in growth potential. Interestingly enough, the research literature and relevant planning studies conclude that the initial size and economic base of a place like North Pickering, would not prejudice its long-run prospects in terms of population and employment. Indeed, its metropolitan setting obviates any influence which initial small size or homogeneous economic base might have on its long-run population and employment volumes.

*However, given the job-mix, live/work and related objectives for North Pickering, the kind and rate of growth in the early period, 1977-86/91, is of a critical importance. Notwithstanding the longer-term assurances suggested by the literature, the initial size and economic structure of the community will influence, amongst other things, the city centre, the live/work objective (and hence commuting), community identity and perhaps the tone or "flavour" of the new town itself.*

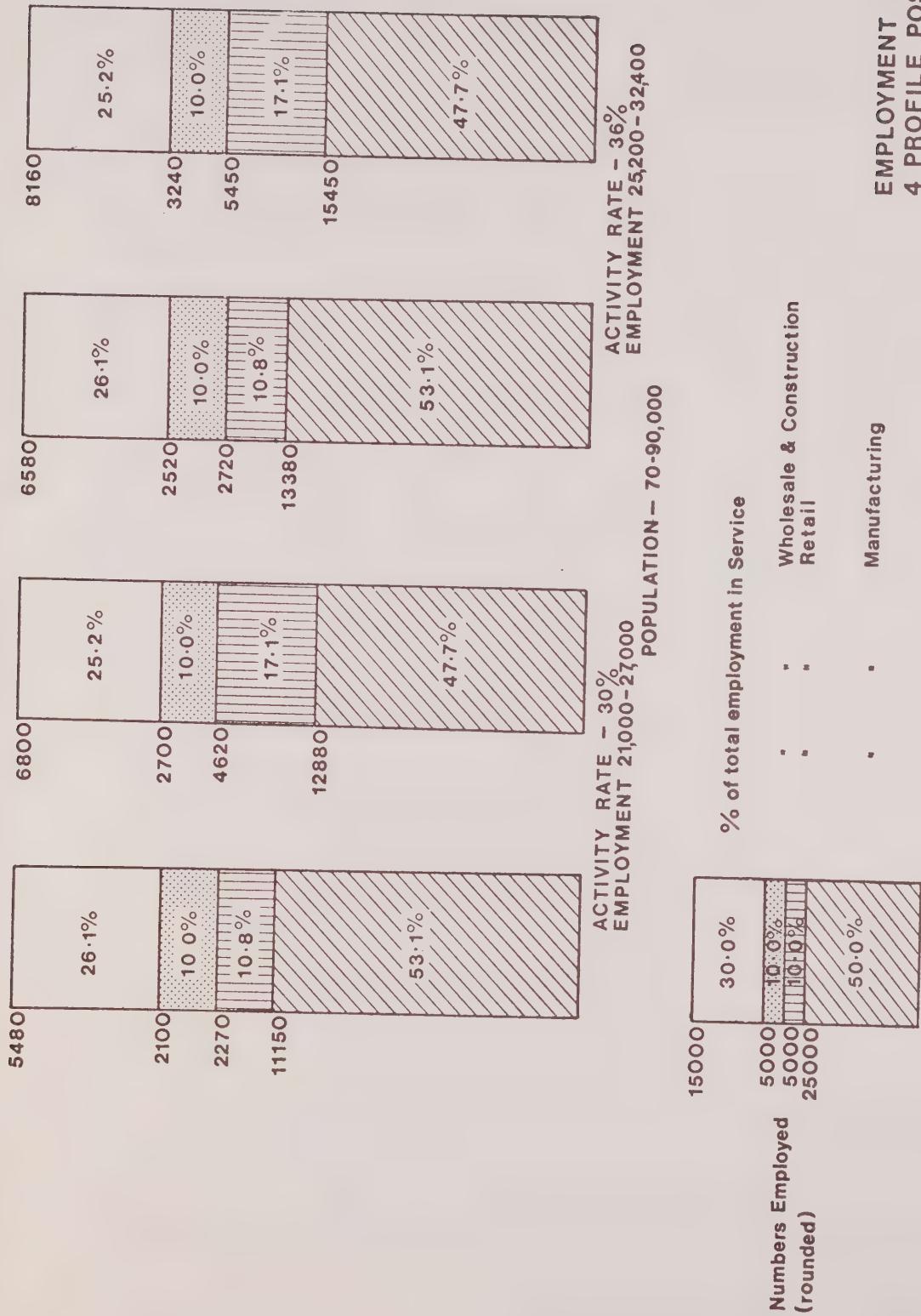
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\* The possibility of an airport does not obviate all problems. The issues became more those of control (e.g. away from the "airport town") than selective development.



EMPLOYMENT VOLUME &  
4 PROFILE POSSIBILITIES  
FOR NORTH PICKERING  
(1986/91)

FIGURE 3



Note: These profile possibilities are derived from regional urban employment patterns and Lakeshore-metropolitan activity rate patterns. As mentioned in the text, in the case of North Pickering the manufacturing sector could be somewhat larger and the service sector smaller.



Within the lakeshore, it appears that the eastern corridor is increasingly in a more competitive position for manufacturing activity and residential opportunities. Indeed Statistics Canada reports that some 66,470 (43.14%) members of the Scarborough labour force found jobs in North York and the City of Toronto in 1971. This part of the metropolis had an employment/population (E/P) ratio in 1970 of around 25%, as compared to Metro's 47%. Projections for 2001 developed by the Metropolitan Toronto Planning Board (MTPB)\* indicate that Scarborough could continue to provide a substantial, mobile labour force (E/P of 44.1% as compared to Metro's 53.5% or Etobicoke's 61.1%). This area therefore will likely continue to lend some support to neighbouring industrial development.

Scarborough is quite close to being fully developed, with limited large-scale residential opportunities remaining. This places North Pickering in a particularly strong competitive position in this particular respect. The Pickering-Ajax area has been the most dynamic residential growth area in the eastern corridor over the last few decades.

Within the general process of out-migrating manufacturing and distribution industries, to the metropolitan fringes, and with the advent of new enterprises, there has been an accelerating development in the economic base of the Pickering-Ajax area. North Pickering will at least share the competitive position of these areas.

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\* Projections to 2001, Population, Housing and Employment, MTPB, Toronto, 1974.



While Scarborough, and other areas still have substantial industrial areas in hand, if not on the market, North Pickering should be able to compete successfully in cost, management, "spec" building "new town image" and other qualitative areas. Taking these ingredients--housing potential, a ready, mobile labour force and an accelerating range of manufacturing and distribution industries--North Pickering is very favourably disposed in terms of residential growth and a vigorous secondary industrial base. This is especially true when the "new town", prime access, serviced land and (possibly) airport factors are added.

In terms of employment the prospects are that:

1. North Pickering under *normal market conditions*, may have an activity rate (employment/population) between 30% and 36% thus having on-site employment between 24,000 and 28,800.
2. With a population of 80,000 it is estimated that North Pickering could have a labour force of at least 33,440 persons.
3. If the overall economic objective of providing a number of on-site job opportunities equal to the resident labour force is to be attained, an activity rate (employment/population) of approximately 42% will be required. This would entail augmenting market prospects, as suggested by the present study, by 6-12% or approximately 4,800-9,600 jobs.
4. If at the lower activity rate (30%) half of the North Pickering resident labour force were to be placed



in local jobs (16,720), this would entail a very high level of "self-containment" (70%), given the number of job opportunities.\*

5. If at the upper activity rate (36%) half of the North Pickering resident labour force were to be placed in local jobs (16,720). this would entail a relatively high level of "self-containment" (58%), given the number of job opportunities.
6. If in lieu of placing half of the resident labour force, a "second-best" objective provides that half of on-site jobs (12-14,400) are to be filled by the local labour force, this will augment out-commuting from 50% of the local labour force to 64% or 57%.

In terms of the possible employment profiles:

1. Manufacturing employment might dominate the urban economic base and could account for more than 53% of total employment.
2. Retail employment could account for 11% to 17% of total employment, or 2,640 to 4,900 jobs depending on the activity rate.\*\*
3. Up to 10% of employment could be in wholesale and construction activities. This could account for 2,400 to 2,880 jobs.
4. Service employment would likely be deficient accounting for no more than 25-26% of total employment, or 6,000 - 7,490 jobs.

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\* By "self-containment" in this context is meant the proportion of local jobs taken up by resident labour force. Compare this rate (70%) to today's (1971) Ajax (33.5%), Whitby (48.9%), Brampton (52.1%), Bramalea (29.4%) or Mississauga (38.7%).  
Source: Statistics Canada (1974).

\*\* Figure 3 maintains the urban population ranges (70-90,000) from which these employment relationships were developed. The employment volumes are therefore marginally different from those calculated using a mid-point population of 80,000, as in the text.



## IMPLICATIONS

The growth, employment and sectoral mix possibilities which are suggested by *market conditions* point to a number of implications which will have to be addressed in the economic planning process for the new town. Once again most of these refer to the no-airport situation.

1. The level of job provision suggested by market conditions may make the live/work objective very onerous. With the upper activity rate (36%) derived from the assumptions of this particular exercise, the assumption of a relatively smaller (20-60 age group) labour force looking for jobs and the achievement of placing 50% of the resident labour force in on-site jobs the community would be characterized by an unusually high level of "self-containment". A short-fall in any or a number of the above variables will, of course, raise the level of out-commuting and the dormitory nature of the community.
2. The degree to which the community could be dominated by manufacturing and distribution activities endangers the objective of a varied socio-economic mix, limits on-site opportunities and thus encourages high commuting volumes.
3. The prospects for the retail sector are uncertain. Local competition (e.g. Scarborough, shopping centres to the south) is evident. The effect is not clear. However, the critical factor of a strong, identifiable market role and town centre are not enhanced by the lack of clear market supremacy in the immediate area by 1986/91.



4. The service sector will likely be deficient in some personal and many business services. Unless made good, this deficiency will detract from the use of the town centre by the residents and others. The absence of many management, information, research, administrative and other business services may detract from the critical milieu of the city centre and even dilute the attractiveness of the town for some manufacturing activities. Conditions in much of the western lakeshore make this area highly competitive with North Pickering. The general momentum of growth, the presence of a large resident labour force currently commuting into Toronto and the O.H.A.P. programme, cumulatively add to this area's competitive potential. The most serious competition however, could come if the Mississauga and Oakville areas start to attract head office, management services and other city centre activities, decentralizing from Toronto.  
The service activities are the prime employment generators and the major activities of city centres. Their role in providing North Pickering with a varied, buoyant employment base is critical. If it is at all feasible to attract these it does appear that their location will have to be actively promoted.
5. The growth prospects in terms of population are good from regional and local perspectives. The implications of a high-growth rate are several including,
  - (a) environmental, aesthetic and stress problems associated with continuous, intensive, large-scale construction,



- (b) the need to ensure the commensurate provision of the basic convenience retail, personal services and social facilities,
- (c) the opportunity to reach quickly, a critical resident population size to support a town centre and foster a sense of community identity,
- (d) the ability to provide a sizeable resident labour force for manufacturing and other enterprises,
- (e) the need to ensure the commensurate expansion of on-site employment opportunities at least with the rate of growth of the resident labour force, and
- (f) the need to off-set substantial levels of out-commuting and associated levels of dormitory development.

This concludes the urban systems analysis exercise of the North Pickering Project. The results of this will be refined through other on-going, or completed studies on industrial migration, manufacturing industry linkage and location requirements and some service activity trends and locational preferences.







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